UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/814,180	04/01/2004	Satoshi Hamasaki	01-615	6453

23400 7590 05/16/2005

POSZ LAW GROUP, PLC
12040 SOUTH LAKES DRIVE
SUITE 101
RESTON, VA 20191

EXAMINER	
MALSAWMA, LALRINFAMKIM HMAR	
ART UNIT	**PAPER NUMBER**
2823	

DATE MAILED: 05/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/814,180	HAMASAKI, SATOSHI	
	Examiner	Art Unit	
	Lex Malsawma	2823	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 February 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01 April 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date ___.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claim 8 is objected to because of the following informalities:

In line 2, before "end surface", the examiner suggests changing "the" to "an".

Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1 and 3-5 are rejected under 35 U.S.C. 102(b) as being anticipated by **Hara** (5,302,850).

Regarding claims 1 and 3:

Hara discloses a method of resin-sealing a semiconductor device 8 (Fig. 1B) formed by disposing the undersurface of a semiconductor chip 8 on one side of an island portion of a lead frame 1 (Fig. 1A and Col. 4, lines 13-14) and connecting the surface of the semiconductor chip to lead portions of the lead frame disposed around the semiconductor chip with plural bonding wires 9 (Fig. 1A-1B), the method comprising:

disposing the semiconductor chip 8 inside a cavity of a forming die 30 (Fig. 9 and Col. 4, lines 16-26) and injecting resin through a gate 10A of the forming die 30 to seal the

semiconductor device with resin in a state where portions of the lead portions are exposed (Fig. 1B and Col. 5, lines 3-11),

wherein the gate 10A of the forming die is disposed directly above the semiconductor chip 214 and the resin is injected through the gate 10A towards the surface of the semiconductor chip in a direction that is substantially orthogonal to the surface of the semiconductor chip 8 (Fig. 1B). Therefore, these claims are anticipated.

Regarding claims 4 and 5:

These claims are similar to claims 1 and 3 except that these claims are directed to the forming die. As detailed above, Hara discloses all features of the currently claimed forming die; therefore, these claims are anticipated.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Wensel** (6,001,672) in view of **Hara** (5,302,850).

Regarding claims 1 and 2:

Wensel discloses a method of resin-sealing a semiconductor device 210 (Fig. 5) formed by disposing the undersurface of a semiconductor chip 214 on one side of an island portion of a

lead frame 220 and connecting the surface of the semiconductor chip to lead portions of the lead frame disposed around the semiconductor chip with plural bonding wires 217, the method comprising:

disposing the semiconductor chip 214 inside a cavity of a forming die 234 (Fig. 9) and injecting resin 224 through a gate of the forming die (i.e., region "238" where the encapsulant material source enters the cavity, see Fig. 9) to seal the semiconductor device with resin in a state where portions of the lead portions are exposed (note exposed tips of "220" in Fig. 5),

wherein the gate (i.e., region "238" in Fig. 9) of the forming die is disposed above the surface of the semiconductor chip 214 and the resin is injected through the gate towards the surface of the semiconductor chip,

wherein the semiconductor device includes a support board (216, 228) at the other side of the island portion, wherein the support board will prevent the island portion from being bent by pressure of the resin in the injection direction of the resin during the injection.

Wensel **lacks** the gate of the forming die being disposed directly above the semiconductor chip. Hara **teaches** that a gate (of a forming die) located directly above and centrally positioned (with respect to a chip being encapsulated) allows the encapsulating resin to initially impact with its greatest force substantially centrally against the chip surface, and the resin thereafter flows radially outward in all directions within the confines of the forming die to completely fill the cavity of the forming die. It would have been obvious to one of ordinary skill in the art to modify Wensel by specifically positioning the gate directly above and centrally located with respect to the chip because Hara teaches that such a positioning allows the

encapsulating resin to flow radially outward in all directions to completely fill the cavity of the forming die.

6. Claims 6 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Hara** (5,302,850) in view of Lemaire et al. (5,417,905; hereinafter, "**Lemaire**").

Regarding claims 6 and 8:

These claims are similar to claim 1 (anticipated by Hara) except that these claims include limitations for an injection mark and its location. Hara **lacks** the limitations with respect to an injection mark. Lemaire **teaches** (in Figs. 28c-29b and Col. 18, lines 8-12) that an injection mark 770 commonly results during/after injecting a resin into a mold comprising a cavity and that the top of the injection mark is lower than an end surface of the resin, especially when an injection gate/nozzle 770 is positioned in a protruding region of an upper mold (as in the upper mold 13A,B of Hara, note gate 10A in Fig. 1B). Although Hara does not specifically disclose an injection mark, given Lemaire, it would have been obvious to one of ordinary skill in the art to modify Hara by specifically reciting that an injection mark is formed because Lemaire teaches/shows that injection marks (having features as currently claimed) commonly result from a resin injection process similar to that disclosed by Hara. Therefore, these claims are held obvious over the cited references.

7. Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Wensel** (6,001,672) in view of **Hara** (5,302,850) and **Lemaire** (5,417,905).

Regarding claims 6 and 7:

These claims are similar to claims 1 and 2 (which are rendered obvious by Wenzel in view of Hara) except that these claims include limitations for an injection mark being disposed directly above the surface of the semiconductor chip. Wenzel (in view of Hara) discloses the gate of a forming die being disposed directly above a semiconductor chip (see above, in section 5, *Regarding claims 1 and 2*), and although Wenzel (in view of Hara) **lacks** specifically disclose an injection mark being formed during encapsulation, Lemaire **teaches** (in Figs. 28c-29b and Col. 18, lines 8-12) that an injection mark 770 commonly results during/after injecting a resin into a mold comprising a cavity. Therefore, it would have been obvious to one of ordinary skill in the art to modify Wenzel (in view of Hara) by specifically reciting that an injection mark is formed because Lemaire teaches/shows that an injection mark commonly results from a resin injection process utilizing a mold (as in Wenzel and/or Hara).

Remarks

8. Applicant's remarks/arguments have been carefully reviewed and considered, but they are generally moot in view of the new grounds of rejection. More specifically, the claims have been amended by removing the limitation requiring the gate of the forming die to be disposed only in a surface facing the surface of the chip, i.e., the current claims require only that a gate be located directly above the chip; therefore, claims 1 and 3-5 (as amended) are now anticipated by Hara (5,302,850). Applicant's remarks with respect to the combination of references including Lemaire (5,417,905) are not persuasive primarily because Lemaire's process is directed to injecting plastic (i.e., resin) into a cavity formed by an upper half 701 and lower half 702of a

mold, wherein Lemaire's process and mold are similar to those disclosed by the other cited references. In other words, Lemaire is cited primarily to show what commonly results from an injection process similar to that disclosed by the other cited references, and given Lemaire, one of ordinary skill in the art would at very least recognize that an injection mark would result (more likely than not) from the process disclosed by the other cited references (Hara and Wensel). Therefore, all pending claims stand rejected under 35 USC § 102 or 103.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lex Malsawma whose telephone number is 571-272-1903. The examiner can normally be reached on Mon. - Thur. (4-12 hours between 5:30AM and 10 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on 571-272-1855. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Lex Malsawma

May 9, 2005

OLIK CHAUDHURI
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800